UNITED
NATIONS

ST

Secretariat

Distr.
GENERAL

ST/SG/AC.10/23/Add.1
5 February 1997

ENGLISH
Original: ENGLISH and FRENCH

**COMMITTEE OF EXPERTS ON THE
TRANSPORT OF DANGEROUS GOODS**

REPORT OF THE COMMITTEE OF EXPERTS ON ITS NINETEENTH SESSION (2-10 December 1996)

Addendum 1

Annex 1: **Amendments to the ninth revised edition of the United Nations Recommendations on the Transport of Dangerous Goods (except Chapter 12, Part I and Chapter 17)**

Annex 2: **Amendments to the second revised edition of the Manual of Tests and Criteria (ST/SG/AC.10/11/Rev.2)**

GE.97-20301

Annex 1

AMENDMENTS TO THE NINTH REVISED EDITION OF THE UNITED NATIONS RECOMMENDATIONS ON THE TRANSPORT OF DANGEROUS GOODS (except Chapter 12, Part I and Chapter 17)

NOTE 1: *For amendments to Chapter 12, Part I and Chapter 17, see annex 3.*

2: *These amendments are presented in accordance with the present structure of the Recommendations. As the Recommendations have been reformatted into Model Regulations annexed to a basic Recommendation, the amendments will be incorporated in the tenth revised edition of the Recommendations on the Transport of Dangerous Goods on the basis of the new structure (see annex 4).*

CHAPTER 1

SCOPE OF THE RECOMMENDATIONS

1.8 Insert a new section as follows:

"**APPLICABILITY**

1.8 The provisions of these Recommendations do not apply to the transport of:

(a) dangerous goods in bulk which, in most countries, are subject to special regulations;

(b) dangerous goods that are required for the propulsion of the means of transport or the operation of its specialized equipment during transport (e.g. refrigeration units) or that are required in accordance with the operating regulations (e.g. fire extinguishers); and

(c) dangerous goods, packaged for retail sale, that are carried by individuals for their own use.

NOTE 1*: Specific modal provisions for the transport of dangerous goods as well as derogations from these general requirements can be found in the modal regulations.*

NOTE 2*: Certain special provisions of Chapter 3 also indicate substances and articles which are not subject to these Recommendations."*

Renumber subsequent sections accordingly as well as all references to Chapter 1 paragraph numbers throughout the Recommendations.

1.43
(new) Insert the following new paragraph 1.43: (after existing paragraph 1.41 which has been renumbered 1.42):

"**1.43** A mixture or solution containing one or more substances identified by name in these Recommendations or classified under a N.O.S. entry and one or more substances not subject to these Recommendations is not subject to these Recommendations if the hazard characteristics of the mixture or solution are such that they do not meet the criteria (including human experience criteria) for any class."

CHAPTER 2

LIST OF DANGEROUS GOODS MOST COMMONLY CARRIED

1. Amend entries in the list as follows:

Insert "279" into column (b3) (Special Provisions) for the following entries:

1230, 1547, 1577, 1578, 1590, 1591, 1661, 1662, 1663, 1671, 1673, 1708, 2023, 2078, 2311, 2432, 2474, 2512, 2730.

UN 0059
UN 0439
UN 0440
UN 0441 } Delete ", COMMERCIAL" from the description.

UN 1105 Amend the name to read "PENTANOLS".

UN 1191 Delete the word "flammable" from the name in column (a2).

UN 1327 Delete "wet, damp or contaminated with oil" from the name in column (a2).
Replace special provision "76" with special provision "281" in column (b3).
Delete packing group "III" in column (c1).

UN 1364 Delete special provision "34" in column (b3).

UN 1366 Add subsidiary risk "4.3" in column (b2).

UN 1370 Add subsidiary risk "4.3" in column (b2).

UN 1391 Add special provision "282" in column (b3).

UN 1435 Add special provision "223" in column (b3).

UN 1500 Add subsidiary risk "6.1" in column (b2).

UN 1921 Add subsidiary risk "6.1" in column (b2).

UN 1950 Delete special provision "197" in column (b3).

UN 2003 Amend the name to read:
"METAL ALKYLS, WATER-REACTIVE, N.O.S. or METAL ARYLS, WATER-REACTIVE, N.O.S."
Add subsidiary risk "4.3" in column (b2).

UN 2344 Delete packing group "II" in column (c1); add special provision "184" in column (b3).

UN 2401 Reclassify from Class 3 to Class 8 (column (b1)).
Change subsidiary risk (column (b2)) from "8" to "3".
Change packing group (column (c1)) from "II" to "I".

UN 2451 Transfer from Division 2.3 to Division 2.2.

UN 2771 Amend the name in column (a2) to read:
"THIOCARBAMATE PESTICIDE, SOLID, TOXIC".

UN 2772 Amend the name in column (a2) to read:
"THIOCARBAMATE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C".

UN 2790 Add new special provision "275" in column (b3).
Delete "II" in the packing group column (c1).

UN 2862 For "II" read "III" in the packing group column (c2).

UN 2908 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - EMPTY PACKAGING".

UN 2909 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM".

UN 2910 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - LIMITED QUANTITY OF MATERIAL".

UN 2911 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, EXCEPTED PACKAGE - INSTRUMENTS or ARTICLES".

UN 2912 Add "non fissile or fissile excepted" to the name in (a2).

UN 2915 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non fissile or fissile-excepted".

UN 2916 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non fissile or fissile-excepted".

UN 2917 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non fissile or fissile-excepted".

UN 2922
UN 2986
UN 2987
UN 2988 Insert "M" in the packing method column (c2).

UN 3005 Amend the name in column (a2) to read:
"THIOCARBAMATE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C".

UN 3006 Amend the name in column (a2) to read:
"THIOCARBAMATE PESTICIDE, LIQUID, TOXIC".

UN 3049 Amend the name in column (a2) to read:
"METAL ALKYL HALIDES, WATER-REACTIVE, N.O.S. or METAL ARYL HALIDES, WATER-REACTIVES, N.O.S.".
Add subsidiary risk "4.3" in column (b2).

UN 3050 Amend the name in column (a2) to read:
"METAL ALKYL HYDRIDES, WATER-REACTIVE, N.O.S. or METAL ARYL HYDRIDES, WATER-REACTIVE, N.O.S.".
Add subsidiary risk "4.3" in column (b2).

UN 3051
UN 3052
UN 3053 Add subsidiary risk "4.3" in column (b2).

UN 3076 In column (c2), add "M".
Add subsidiary risk "4.3" in column (b2).

UN 3147 Change special provision "184" to "185" in column (b3).

UN 3153 Insert "M" in the packing method column (c2).

UN 3164 Add special provision "283" in column (b3).

UN 3166 Delete special provision "117" in column (b3).

UN 3171 Delete "wet battery" from the name in column (a2).

UN 3203 Amend the name to read:
"PYROPHORIC ORGANOMETALLIC COMPOUND, WATER-REACTIVE, N.O.S.".
Add subsidiary risk "4.3" in column (b2). Add "M" in column (c2).

UN 3207 Insert "M" in the packing method column (c2).

UN 3257 At the end of the name and description in column (a2), add the words: "(including molten metals, molten salts, etc.)".

UN 3268 Amend the name in column (a2) to read:
"AIR BAG INFLATORS pyrotechnic or AIR BAG MODULES pyrotechnic or SEAT-BELT PRETENSIONERS pyrotechnic".
Add special provision "280" in column (b3).

UN 3319 Amend the name to read:
"NITROGLYCERIN MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 2 % but not more than 10 % nitroglycerin, by mass".
Add Special Provisions 109 and 274 in column (b3).

UN 3323 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE C PACKAGE, non fissile or fissile-excepted".

UN 3327 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form".

UN 3328 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE".

UN 3329 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE".

UN 3330 Amend the name in column (a2) to read:
"RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE".

2. Delete the following entries:

2666, 2767, 2768, 3001, 3002, 2773, 2774, 3007, 3008, 2769, 2770, 3003, 3004, 2765, 2766, 2999, 3000.

3. Add new entries as follows:

	"(a1) (a2)	(b1)	(b2)	(b3)	(c1)	(c2)
3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non fissile or fissile-excepted	7				
3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE	7				
3334	AVIATION REGULATED LIQUID, N.O.S.	9		106 274 276		
3335	AVIATION REGULATED SOLID, N.O.S.	9		106 274 276		
3336	MERCAPTANS, LIQUID, FLAMMABLE, N.O.S. or MERCAPTAN MIXTURE, LIQUID, FLAMMABLE, N.O.S.	3		185 274		M
3337	REFRIGERANT GAS R 404A	2.2				M
3338	REFRIGERANT GAS R 407A	2.2				M
3339	REFRIGERANT GAS R 407B	2.2				M
3340	REFRIGERANT GAS R 407C	2.2				M
3341	THIOUREA DIOXIDE	4.2		184		
3342	XANTHATES	4.2		184		
3343	NITROGLYCERIN MIXTURE, DESENSITIZED, LIQUID, FLAMMABLE, N.O.S. with not more than 30% nitroglycerin, by mass	3		109 274 278		
3344	PENTAERYTHRITE TETRANITRATE MIXTURE, DESENSITIZED, SOLID, N.O.S. with more than 10% but not more than 20% PETN, by mass	4.1		109 272 274	II	
3345	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, SOLID, TOXIC	6.1		61 109 274		

(a1)	(a2)	(b1)	(b2)	(b3)	(c1)	(c2)
3346	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	61 109 130 274		
3347	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	61 109 274		
3348	PHENOXYACETIC ACID DERIVATIVE PESTICIDE, LIQUID, TOXIC	6.1		61 109 274		
3349	PYRETHROID PESTICIDE, SOLID, TOXIC	6.1		61 109 274		
3350	PYRETHROID PESTICIDE, LIQUID, FLAMMABLE, TOXIC, flash point less than 23 °C	3	6.1	61 109 130 274		
3351	PYRETHROID PESTICIDE, LIQUID, TOXIC, FLAMMABLE, flash point not less than 23 °C	6.1	3	61 109 274		
3352	PYRETHROID PESTICIDE, LIQUID, TOXIC	6.1		61 109 274		
3353	AIR BAG INFLATORS, COMPRESSED GAS or AIR BAG MODULES, COMPRESSED GAS or SEAT-BELT PRETENSIONERS, COMPRESSED GAS	2.2		280		
3354	INSECTICIDE GAS, FLAMMABLE, N.O.S.	2.1		109 274		
3355	INSECTICIDE GAS, TOXIC, FLAMMABLE, N.O.S.	2.3	2.1	109 274		
3356	OXYGEN GENERATOR, CHEMICAL	5.1		284	II	

CHAPTER 3

SPECIAL PROVISIONS RELATING TO INDIVIDUAL SUBSTANCES AND ARTICLES

43 Amend to read as follows:

"When offered for carriage as pesticides, these substances shall be carried under the relevant pesticide entry and in accordance with the relevant pesticide provisions (see 6.6 and 6.7)".

61 Amend to read as follows:

"The technical name which shall supplement the proper shipping name shall be the ISO common name, other name listed in 'The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification' or the name of the active substance (see also 13.8.4.1)".

68 Amend to read as follows:

"This substance in concentrations of:

- more than 70% should be placed in Packing Group I and bear a subsidiary risk label of Division 5.1;

- not more than 70 % should be placed in Packing Group II and not bear a subsidiary risk label."

170 Amend "non-injurious" to read "non-toxic" and amend the end to read as follows:

"....electric storage batteries (Class 8) and lithium batteries (Class 9)."

197 Delete.

230 Delete subparagraphs (f) and (h)-(l).
Existing (a) becomes (b).
Insert a new (a) as follows:

"(a) each cell or battery type has been determined to meet the criteria for assignment to Class 9 on the basis of tests carried out in accordance with the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part III, sub-section 38.3;"

Existing (b) becomes (c).
Existing (c) becomes (d) with the deletion of the words "in such a manner as".
Existing (d) becomes (e).
Existing (e) becomes (f).
In subparagraph (g) delete the words "in such a manner as".

239 Insert at the beginning: "Except for air transport..." .
After "vehicles" add "(UN 3171)".

240 Add "or sodium batteries" after "powered by wet batteries".

Add new special provisions as follows:

"**275** Solutions with more than 10% and less than 50% acid, by mass, should be placed in Packing Group III.

Solutions with not less than 50% but not more than 80% acid, by mass, should be placed in Packing Group II.

276 This includes any substance which is not covered by any of the other classes but which has narcotic, noxious or other properties such that, in the event of spillage or leakage on an aircraft, annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

278 These substances should not be classified and transported unless authorized by the competent authority on the basis of results from Series 2 test and a Series 6(c) test on packages as prepared for transport (see para. 4.4.5). The competent authority should assign the packing group on the basis of the Chapter 5 criteria and the package type used for the Series 6(c) test.

279 The substance is assigned to this classification or Packing Group based on human experience rather than the strict application of classification criteria set out in the Recommendations.

280 This entry applies to articles which are used as life saving vehicle air bag inflators or air bag modules or seat-belt pretensioners, containing a gas or a mixture of compressed gases classified under Division 2.2 and with or without small quantities of pyrotechnic material. For units with pyrotechnic material, initiated explosive effects shall be contained within the pressure vessel such that the unit may be excluded from Class 1 in accordance with 1.11 (b), in conjunction with 16.6.1.4.7 (a) (ii) of the Manual of Tests and Criteria, Part 1. In addition, units shall be designed or packaged for transport so that when engulfed in a fire there will be no fragmentation of the pressure vessel or projection hazard. This shall be determined by analysis.

The pressure vessel should be in compliance with the requirements for the gas(es) contained in the pressure vessel.

Air bags or seat-belts installed in vehicles or in completed vehicle components such as steering columns, door panels, seats etc. are not subject to these Recommendations.

281 The transport by sea of hay, straw or bhusa, wet, damp or contaminated with oil should be prohibited. Transport by other modes should also be prohibited except with special authorization by the competent authorities.
Hay, straw and bhusa, when not wet, damp or contaminated with oil, are subject to these Recommendations only when transported by sea.

282 Suspensions with a flash point of not more than 60.5 °C should bear a flammable liquid subsidiary risk label.

283 Articles intended to function as shock absorbers are not subject to these Recommendations provided each article:

(a) has a gas space capacity not exceeding 1 litre and a charge pressure not exceeding 50 bar;

(b) has a minimum burst pressure of 4 times the charge pressure at 20 °C;

(c) is manufactured from material which will not fragment upon rupture;

(d) when subjected to fire, is protected from rupture by means of a fire degradable seal or a pressure relief device to relieve internal pressure; and

(e) is manufactured in accordance with a quality assurance standard acceptable to the competent authority.

284 An oxygen generator, chemical, containing oxidizing substances should meet the following conditions:

(a) the generator when containing an explosive actuating device should only be transported under this entry when excluded from Class 1 in accordance with paragraph 1.11(b) of these Recommendations;

(b) in addition to the requirements of Packing Group II applicable to the package, the generator, without its packaging, should be capable of withstanding a 1.8 m drop test onto a rigid, non-resilient, flat and horizontal surface, in the position most likely to cause damage, without loss of its contents and without actuation;

(c) when a generator is equipped with an actuating device, it should have at least two positive means of preventing unintentional actuation;

(d) the generator(s) should be transported in a package which will meet the following requirements when one generator in the package is actuated:

(i) other generators in the package will not be actuated;
(ii) packaging material will not ignite; and
(iii) the outside surface temperature of the completed package will not exceed 100 °C".

CHAPTER 4

SPECIAL RECOMMENDATIONS RELATING TO CLASS 1

4.8.2.14 Change the last sentence to read:

"Such unpackaged articles may be fixed to cradles or contained in crates or other suitable handling, storage or launching devices in such a way that they will not become loose during normal conditions of transport."

Add a new sub-paragraph as follows:

"Where such large explosive articles are as part of their operational safety and suitability tests subjected to test regimes that meet the intentions of these Recommendations and such tests have been successfully undertaken, the competent authority may approve such articles to be transported under these Recommendations."

4.9 In the definition for the entry "CHARGES, SHAPED, COMMERCIAL without detonator" delete the word ",COMMERCIAL".

Table 4.4

Delete the word ", commercial" in the following entry:

"Charges, shaped, commercial without detonator: 0059, 0439, 0440, 0441".

CHAPTER 5

SPECIAL RECOMMENDATIONS RELATING TO CLASS 3

Amend 5.6 (b) to read:

"**5.6** (b) The mixture does not contain any substances with a primary or a subsidiary risk of Division 6.1 or Class 8".

5.6 Delete the Note.

CHAPTER 6

SPECIAL RECOMMENDATIONS RELATING TO CLASS 6

6.3.2 Delete the current footnote (a) to the table in paragraph 6.3.2 and renumber the remaining footnote (b) as footnote (a).

6.7.2 Add the following note to the end of paragraph 6.7.2:

"***NOTE***: *LD50 toxicity data for a number of common pesticides may be obtained from the most current edition of the document "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification" available from the International Programme on Chemical Safety, World Health Organization (WHO), 1211 Geneva 27, Switzerland. While that document may be used as a source of LD50 data for pesticides, its classification system should not be used for purposes of transport classification of, or assignment of packing groups to, pesticides, which should be in accordance with these Recommendations.*"

6.7.3 Replace the existing text in paragraph 6.7.3 with the following:

"The proper shipping name used in the transport of the pesticide should be selected on the basis of the active ingredient, of the physical state of the pesticide and any subsidiary risks it may exhibit."

Table 6.1 Delete.

6.9.4 **Amend to read as follows:**

"**6.9.4** *Biological products* are those ... (unchanged) ... and diagnostic products.

For the purposes of these Recommendations, biological products are divided into the following groups:

(a) those which contain pathogens in risk group 1; those which contain pathogens under such conditions that their ability to produce disease is very low to none; and those known not to contain pathogens.

Substances in this group are not considered infectious substances for the purposes of these Recommendations;

(b) those manufactured and packaged in accordance with the requirements of national governmental health authorities and transported for the purposes of final packaging or distribution, and use for personal health care by medical professionals or individuals.

Substances in this group are not subject to the Recommendations applicable to Division 6.2;

(c) those known or reasonably expected to contain pathogens in risk groups 2, 3, or 4 and which do not meet the criteria of 6.9.4(b) above.

Substances in this group should be classified in Division 6.2 under UN 2814 or UN 2900, as appropriate.

NOTE: *Some licensed biological products may ...* (unchanged) *... other restrictions.*"

6.9.5 Amend to read:

"6.9.5 *Diagnostic specimens* are any human or animal material including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluids being transported for diagnostic or investigation purposes, but excluding live infected animals.

For the purposes of these Recommendations diagnostic specimens are divided into the following groups:

(a) those known or reasonably expected to contain pathogens in risk groups 2, 3 or 4 and those where a relatively low probability exists that pathogens of risk group 4 are present. Such substances should be classified in Division 6.2 under UN 2814 or UN 2900, as appropriate. Specimens transported for the purpose of initial or confirmatory testing for the presence of pathogens fall within this group;

(b) those where a relatively low probability exists that pathogens of risk groups 2 or 3 are present. Specimens transported for the purpose of routine screening tests or initial diagnosis for other than the presence of pathogens fall within this group;

(c) those known not to contain pathogens."

6.9.6 To be deleted; renumber consequently.

6.10 Amend to read:

"**6.10 Biological products and diagnostic specimens**

6.10.1 Biological products known to contain, or thought likely to contain, any infectious substances should meet the requirements for infectious substances. Biological products referred to in 6.9.4 (a) and (b) are not subject to the Recommendations applicable to Division 6.2.

6.10.2 Diagnostic specimens ..."

6.13.2 At the end of the sentence add the following new sentence:

"Complete packages may be overpacked in accordance with the provisions of 13.9; such an overpack may contain dry ice."

6.13.3 Amend 6.13.3 (b) (ii) as follows:

"(ii) For substances consigned refrigerated or frozen, ice, dry ice or other refrigerant should be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.13.6. Interior supports should be provided to secure secondary packaging(s) or packages in position after the ice ordry ice has dissipated. If ice is used, the outer packaging or overpack should be leakproof. If dry ice is used, the outer packaging or overpack should permit the release of

carbon dioxide gas. The primary receptacle and the secondary packaging should maintain their integrity at the temperature of the refrigerant used."

6.14.9 Renumber as a new paragraph 6.10.3.

At the end of the first sentence amend "of this section" to read "6.14".

CHAPTER 7

SPECIAL RECOMMENDATIONS RELATING TO CLASS 7

Amend the entries for IAEA Schedules in the table as follows:

IAEA SCHEDULES 2/	UN NUMBER
9	2915, 3332
9 + 13 3/	3327, 3333

CHAPTER 9

GENERAL RECOMMENDATIONS ON PACKING

9.2.1 In the definition of "reconditioned packagings" insert "(a)" before "metal drums" and add a new subparagraph (b) as follows:

"(b) plastics drums and jerricans that:

(i) are cleaned to original materials of construction, with all former contents, external coatings and labels removed;

(ii) have all non-integral gaskets replaced; and

(iii) are inspected after cleaning with rejection of packagings with visible damage such as tears, crease or cracks, or damaged threads or closures or other significant defects."

Insert at the appropriate place a defintion for "Recycled plastics material" as follows:

"*Recycled plastics material* means material recovered from used industrial packagings that has been cleaned and prepared for processing into new packagings. The specific properties of the recycled material used for production of new packagings should be assured and documented regularly as part of a quality assurance programme recognized by the competent authority. The quality assurance programme should include a record of proper pre-sorting and verification that each batch or recycled plastics material has the

proper melt flow rate, density, and tensile yield strength, consistent with that of the design type manufactured from such recycled material. This necessarily includes knowledge about the packaging material from which the recycled plastics have been derived, as well as awareness of the prior contents of those packagings if those prior contents might reduce the capability of new packagings produced using that material. In addition, the packaging manufacturer's quality assurance programme under 9.3.14 should include performance of the mechanical design type test in 9.7 on packagings manufactured from each batch of recycled plastics material. In this testing, stacking performance may be verified by appropriate dynamic compression testing rather than static load testing."

Revise the definition of "remanufactured packagings" in 9.2.1 by inserting an "(a)" before "metal drums" and adding a new "(b)" as follows:

"(b) plastics drums that:

(i) are converted from one UN type to another UN type (eg 1H1 to 1H2); or
(ii) undergo the replacement of integral structural components."

9.6.7.1 Amend the beginning of the second sentence to read:

"Except for recycled plastics material as defined in 9.2.1, no...(rest unchanged)"

9.6.7.2 Add a new sentence as follows:

"Packagings manufactured with such recycled plastics material should be marked "REC" near the marks prescribed in 9.5.1."

9.7.6.3 Delete the sentence before last one.

CHAPTER 11

SPECIAL RECOMMENDATIONS RELATING TO CLASS 5

11.3.5.4 Amend as follows:

The following organic peroxides should be subjected to temperature control during carriage:

organic peroxides type B and C with an SADT ≤ 50 °C;

organic peroxides type D showing a medium effect when heated under confinement */ with a SADT ≤ 50 °C or showing a low or no effect when heated under confinement with a SADT < 45 °C; and

organic peroxides types E and F with a SADT < 45 °C.

11.3.6.2 Add as follows:

"**11.3.6.2** Test methods for determining the flammability are given in Part III, 32.4 of the Manual of Tests and Criteria. Because organic peroxides may react vigorously when heated it is recommended to determine their flash point using small sample sizes such as described in ISO 3679:1983."

11.3.10.6 (c) Replace by the following text:

"Single mechanical refrigeration; provided that for organic peroxides with a flashpoint lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings are used within the cooling compartment to prevent ignition of flammable vapours from the organic peroxides."

11.3.10.6 (e) Replace the last indent, by the following text:

"for organic peroxides with a flash point lower than the sum of the emergency temperature plus 5 °C explosion-proof electrical fittings are used within the cooling compartment to prevent ignition of flammable vapours from the organic peroxides."

11.3.12.3 Amend to read as follows:

"To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing the emergency-relief devices should be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of complete fire-engulfment calculated by the equations as given in 12.558."

---

*/ *As determined by test series E as prescribed in the current edition of the Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria, Part II.*

Table 11.3 Insert the following organic peroxide into table 11.3:

Organic peroxide:	ISOPROPYL sec-BUTYL PEROXYDICARBONATE + DI-sec-BUTYL PEROXYDICARBONATE + DI-ISOPROPYL PEROXYDICARBONATE
Concentration (%)	≤ 32 + ≤ 15-18 + ≤ 12-15
Diluent type A (%)	≥ 38
Packing Method	OP7
Control Temperature (°C)	-20 °C
Emergency Temperature (°C)	-10 °C
Number (Generic entry)	3115

Table 11.4

1. Add an introductory note following the heading of Table 11.4 to read:

"***NOTE***: *When consigning an organic peroxide in an IBC in accordance with the following provisions, it is the responsibility of the consignor to ensure that:*

(a) The pressure and emergency relief devices installed on the IBC are designed to take appropriate account of the self-accelerating decomposition of the organic peroxide and of fire engulfment; and

(b) When applicable, the control and emergency temperatures indicated are appropriate, taking into account the design (e.g. insulation) of the IBC to be used."

2. Add a footnote to the column headings reading "Control Temperature" and "Emergency Temperature" with the footnote to read:

" *2/ The temperatures indicated are based on a non-insulated IBC."*

3. Amend the entry for "Peroxyacetic acid, stabilized, not more than 17%" as follows:

(a) in the third column ("Type of IBC"), add: "31HA1" and "31A"; and

(b) in the fourth column ("Maximum quantity (litres)"), delete the figure "1000" and insert the figure "1500" for IBC types 31H1, 31HA1 and 31A.

CHAPTER 12

RECOMMENDATIONS ON MULTIMODAL TANK TRANSPORT

For changes to Part I, see annex 3.

Part II

Tables 12.1 and 12.2

1. Amend as necessary to reflect the changes adopted for Chapter 2.

2. Add the following entries to Table 12.1

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3153	Perfluoro (methyl vinyl ether)	2.1		14.3 13.4 11.2 10.2		A	N.	1.14
3337	Refrigerant gas R 404A	2.2		31.6 28.2 25.2 22.1	Allowed	Normal	0.82	
3338	Refrigerant gas R 407A	2.2		32.3 29.0 25.7 22.4	Allowed	Normal	0.94	
3339	Refrigerant gas R 407B		2.2	30.5 27.0 23.6	34.0	Allowed	Normal	0.93
3340	Refrigerant gas R 407C	2.2		30.2 27.0 24.1 21.4	Allowed	Normal	0.95	

3. Amend entries in Table 12.2 as follows:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1921	Propyleneimine, inhibited	3/I		6	6mm	N.A.	12.9.3	12.22.3
2401	Piperidine	8/I	3	4	6mm	A/12.7.3	12.9.3	12.22.3
2790	Acetic acid solution more than 10% but not more than 80% acid by mass	8/II		2.65	12.5.2	A/12.7.3	N.	12.22.3
		8/III		2.65	12.5.2	A/12.7.2	N.	12.22.2
2922	Corrosive liquid, toxic, n.o.s.	8/I	6.1	4	8mm	N.A.	12.9.3	12.22.3
		8/II	6.1	4	6mm	N.A.	12.9.3	12.22.3
		8/III	6.1	2.65	12.5.2	12.7.3	N.	12.22.2
2986	Chlorosilanes, corrosive, flammable, n.o.s.	8/II	3	4	6mm	12.7.3	12.9.3	12.22.3
2987	Chlorosilanes, corrosive, n.o.s.	8/II		4	12.5.2	12.7.3	N.	12.22.3
2988	Chlorosilanes, water-reactive, flammable, corrosive, n.o.s."	4.3/I	3 8	4	6mm	N.A.	12.9.3	12.22.3

4. Add the following new Note 15 to Table 12.2:

"**15** *The portable tank may be fitted with a device located under maximum filling conditions in the vapour space of the shell to prevent the build up of excess pressure due to the slow decomposition of the substance transported. This device should also prevent an unacceptable amount of leakage of liquid in the case of overturning or entry of foreign matter into the tank. This device should be approved by the competent authority or its authorized body.*"

Add superscript "15" after the name in column (2) for the following entries: 1791, 1908, 2014, 2015, 2984 and 3149.

Add new entries to Table 12.2 as follows:

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3076	Aluminium alkyl hydrides [2.10]	4.2/I	4.3	10	10mm	N.A.	N.	12.22.3
3203	Pyrophoric organometallic compound water-reactive, n.o.s. [2.10]	4.2/I	4.3	10	10 mm	N.A.	N.	12.22.3
3207	Organometallic compound [2.10] or compound solution [2.10] or compound dispersion [2.10], water-reactive, flammable, n.o.s.	4.3/185	3	10	10mm	N.A	N.	12.22.3
3336	Mercaptans, liquid, flammable, n.o.s. or Mercaptan mixture, liquid, flammable, n.o.s.	3/I		6	6mm	N.A.	N.	12.22.3
		3/II		2.65	12.5.2	12.7.3	N.	12.22.2
		3/III		1.5	12.5.2	12.7.3	N.	12.22.2
3347	Phenoxyacetic acid derivative pesticide, liquid, toxic, flammable [4]		6.1	3	4.00	12.5.2	A/12.7.3	12.22.3
3348	Phenoxyacetic acid derivative pesticide, liquid, toxic [4]	6.1		4.00	12.5.2	A/12.7.3	N.	12.22.3
3351	Pyrethroid pesticide, liquid, toxic, flammable [4]		6.1	3	4.00	12.5.2	A/12.7.3	12.22.3
3352	Pyrethroid pesticide, liquid, toxic [4]	6.1		4.00	12.5.2	A/12.7.3	N.	12.22.3

CHAPTER 13

RECOMMENDATIONS ON CONSIGNMENT PROCEDURES

13.2 Amend 13.2 to read: "Marking".

13.2.1 Amend 13.2.1, first sentence at the end to read:

"... on each package. In the case of unpackaged articles the marking should be displayed on the article, on its cradle or on its handling, storage or launching device."

13.3.1 Amend first sentence to read:

"The labels recommended in 13.4 should be affixed on goods or packages."

13.6.8 Replace the word "international" with "multimodal".

"Amend footnote 1/ to read:

" 1/ *If used, the relevant recommendations of the UN/ECE Working Party on Facilitation of International Trade Procedures may be consulted, in particular Recommendation No.1 (United Nations Lay-out Key for Trade Documents) (ECE/TRADE/137, edition 82.2), Recommendation No.11 (Documentary Aspects of the International Transport of Dangerous Goods) (ECE/TRADE/204, edition 96.1) and Recommendation No.22 (Layout Key for Standard Consignment Instructions) (ECE/TRADE/168). Refer to the Trade Data Elements Directory, Volume III, Trade Facilitation Recommendations (ECE/TRADE/200) (United Nations publication Sales No.E.96.II.E.13)*

13.8.4.1 For "other name(s) in Table 6.1", read "other name(s) in the WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification".

Figure 13.4 Replace Figure 13.4 with the figure reproduced overleaf, with the title "Example of a form which may be used as a combined dangerous goods declaration and container packing certificate for multimodal transport of dangerous goods".

MULTIMODAL DANGEROUS GOODS FORM

1. Shipper / Consignor / Sender	2. Transport document number 3. Page 1 of Pages 4. Shipper's reference 5. Freight Forwarder's reference
6. Consignee	7. Carrier (to be completed by the carrier)
	SHIPPER'S DECLARATION I hereby declare that the contents of this consignment are fully and accurately described below by the proper shipping name, and are classified, packaged, marked and labelled / placarded and are in all respects in proper condition for transport according to the applicable international and national governmental regulations
8. This shipment is within the limitations prescribed for: (Delete non-applicable) PASSENGER AND CARGO AIRCRAFT / CARGO AIRCRAFT ONLY	9. Additional handling information
10. Vessel / flight no. and date / 11. Port / place of loading	
12. Port / place of discharge / 13. Destination	

14. Shipping marks	* Number and kind of packages; description of goods	Gross mass (kg)	Net mass	Cube (m3)

15. Container identification No. / vehicle registration No.	16. Seal number (s)	17. Container/vehicle size & type	18. Tare (kg)	19. Total gross mass (including tare) (kg)

CONTAINER/VEHICLE PACKING CERTIFICATE I hereby declare that the goods described above have been packed / loaded into the container/vehicle identified above in accordance with the applicable provisions ** **MUST BE COMPLETED AND SIGNED FOR ALL CONTAINER/VEHICLE LOADS BY PERSON RESPONSIBLE FOR PACKING/LOADING**	21 RECEIVING ORGANISATION RECEIPT Received the above number of packages/containers/trailers in apparent good order and condition unless stated hereon. RECEIVING ORGANISATION REMARKS
20. Name of company	Hauler's name / 22. Name of company (OF SHIPPER PREPARING THIS NOTE)
Name / Status of declarant	Vehicle reg. no. / Name/Status of declarant
Place and date	Signature and date / Place and date
Signature of declarant	DRIVER'S SIGNATURE / Signature of declarant

* FOR DANGEROUS GOODS, as must specify proper shipping name, hazard class, UN no., packing group (where assigned) and any other element of information required under applicable national and international regulations

** For the purposes of these Recommendations, see paragraph 13.6.6.

MULTIMODAL DANGEROUS GOODS FORM — Continuation Sheet

1. Shipper / Consignor / Sender	2. Transport document number	
	3. Page 2 of Pages	4. Shipper's reference
		5. Freight Forwarder's reference

14. Shipping marks	* Number and kind of packages; description of goods	Gross mass (kg)	Net mass	Cube (m3)

* For packages which must clearly show shipping name, hazard class, UN/ID number and, where applicable, packing group (and where applicable and any other element of information required under applicable national and international regulations)

BACK-HATCHINGS BACK-HATCHINGS BACK-HATCHINGS

CHAPTER 14

SPECIAL RECOMMENDATIONS RELATING TO CLASS 4

14.2.2.9.2 Amend to read as follows:

"To prevent explosive rupture of metal IBCs or composite IBCs with complete metal casing, the emergency-relief devices should be designed to vent all the decomposition products and vapours evolved during self-accelerating decomposition or during a period of not less than one hour of fire engulfment calculated by the equations given in 12.558."

CHAPTER 15

SPECIAL RECOMMENDATIONS FOR DANGEROUS GOODS IN LIMITED QUANTITIES

15.1 Amend the end of the first sentence to read:

"...certain classes packed in limited quantities."

15.3.2 Amend and add at the end of the first sentence:

", except that inner packagings that are liable to break or be easily punctured such as those made of glass, porcelain, stoneware or certain plastics, materials, etc, should not be transported in such packagings."

15.7 Amend to read as follows:

"Limited quantities of dangerous goods for personal or household use, that are packaged and distributed in a form intended or suitable for sale through retail agencies, may furthermore be exempted from marking of the proper shipping name and UN number on the packaging and from the requirements for a dangerous goods transport document."

Table 15.1

For flammable liquids, Packing Group II, amend in the last column to read: "1 litre".

CHAPTER 16

RECOMMENDATIONS ON INTERMEDIATE BULK CONTAINERS (IBCs)

The text is replaced by the text in ST/SG/AC.10/C.3/R.710 with the following modifications:

16.1.6.9 Add a new paragraph:

"The periodic testing and inspection requirements for IBCs are provided in sections 16.2, 16.4 and 16.5. An IBC should not be filled and offered for transport after the

date

of expiry of the last periodic test required by 16.2.6, 16.4.6 or 16.5.6, or the date of expiry of the last periodic inspection required by 16.2.7, 16.4.7 or 16.5.7.

However, an IBC filled prior to the date of expiry of the last periodic test or inspection may be transported for a period not to exceed three months beyond the date of expiry of the last periodic test or inspection.

In addition, an IBC may be transported after the date of expiry of the last periodic test or inspection:

(a) After emptying but before cleaning, for purposes of performing the required test or inspection prior to refilling; and

(b) Unless otherwise approved by the competent authority, for a period not to exceed six months beyond the date of expiry of the last periodic test or inspection in order to allow the return of dangerous goods for proper disposal or recycling. Reference to this exemption should be entered in the transport document."

16.2.3.2 To be deleted.

APPENDIX A

LIST OF GENERIC OR N.O.S. PROPER SHIPPING NAMES

Amend as necessary in accordance with the amendments adopted for Chapter 2.

INDEX

Amend as necessary in accordance with the amendments adopted for Chapter 2.
In addition, add the following entries:

"Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 23% difluoromethane and 25% pentafluoroethane, see	2.2	3337
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 20% difluoromethane and 40% pentafluoroethane, see	2.2	3338
Difluoromethane, pentafluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 10% difluoromethane and 70% pentafluoroethane, see	2.2	3339

Pentafluoroethane, 1,1,1-trifluoroethane, and 1,1,1,2-tetrafluoroethane azeotropic mixture with approximately 44% pentafluoroethane and 52% 1,1,1-trifluoroethane, see		2.2	3340"
Amend the name	"3-Methyl-2-penten-4-yne-1 ol, see	8	2705"
to	"3-Methyl-2-penten-4-ynol, see	8	2705"

Add a cross reference to the entry for thiourea dioxide as follows:

"Formamidine sulphinic acid, see	4.2	3341"

Delete the entry "Ammonium tetrachloromercurate (II)".

Annex 2

AMENDMENTS TO THE SECOND REVISED EDITION OF THE MANUAL OF TESTS AND CRITERIA (ST/SG/AC.10/11/Rev.2)

Figure 10.2 Replace respectively "New substance" in box 1 and "New Article" in box 14 with "Substance for Classification" and "Article for Classification"

Add the following footnote in Box No.3:

"For classification purposes, start with test series 2."

32.3.7 (b) Amend to read:

"The mixture does not contain any substances with a primary or a subsidiary risk of Division 6.1 or Class 8."

32.3.7 Delete the Note.

Appendix 5:

Example of a test method for vent sizing

1. Introduction

In the third sentence delete "(heat load 110 kW/m^2)".

3. Calculation of heating rate to be used in the test

Amend to read as follows:

"If a portable tank is non-insulated, a heat load of the shell as given in 12.558*/ is required. For an insulated tank, the Recommendations require that the heat load to the shell be equivalent to the heat transfer through the insulation plus the heat load to the shell on the assumption that 1% of the insulation is missing.

---

*/ *4.2.1.13.8 of the Model Regulations.*

The following information on the portable tank and organic peroxide is needed for the heating rate calculation:

F_t	= fraction of tank directly heated (1 if non-insulated, 0.01 if insulated)	[-]
M_t	= total mass of organic peroxide and diluent	[kg]
K	= heat conductivity of the insulation layer	[$W.m^{-1}.K^{-1}$]
L	= thickness of insulation layer	[m]
U	= K/L = heat transfer coefficient	[$W.m^{-2}.K^{-1}$]
A	= wetted area of portable tank	[m^2]
C_p	= specific heat of the organic peroxide formulation	[$J/(kg^{-1}.K^{-1})$]
T_{PO}	= temperature of peroxide formulation at relieving conditions	[K]

Heat input, q_i (W), via <u>indirectly</u> exposed surface (insulated part) is calculated by equations (1) and (2):

$$q_i = 70961 \; F \; (1 - F_t) \; A^{0.82} \qquad (1)$$

where:

F = insulation factor:

F = 1 for non-insulated vessels, or

$$F = 2 \; \frac{U \; (923 - T_{PO})}{47032} \quad \text{for insulated vessels.} \qquad (2)$$

In the calculation of F a multiplication factor of 2 is introduced to take into account a 50% loss in insulation efficiency in an incident.

Heat input, q_d (W), via the <u>directly</u> exposed surface (non-insulated part) is calculated by equation (3):

$$q_d = 70961 \; F \; F_t \; A^{0.82} \qquad (3)$$

where:

F = insulation factor = 1 (non-insulated)

The overall heating rate, dT/dt (K/min), due to fire engulfment is calculated by equation (4):

$$dT/dt = \frac{(q_i + q_d)}{M_t \; C_p} \; 60 \qquad (4)$$

Example:

For a typical 20 m^3 insulated portable tank:

F_r	= fraction of tank directly heated	=	0.01
M_t	= total mass of organic peroxide and diluent	=	16268 kg
K	= heat conductivity of the insulation layer	=	0.031 $W.m^{-1}.K^{-1}$
L	= thickness of the insulation layer	=	0.075 m
U	= heat transfer coefficient	=	0.4 $W.m^{-2}.K^{-1}$
A	= wetted area of portable tank	=	40 m^2
C_p	= specific heat of the organic peroxide form.	=	2000 $J.kg^{-1}.K^{-1}$
T_{PO}	= temperature of peroxide at relieving conditions	=	100 °C

and

$$q_t = 70961 \times 2\,\frac{0.4\times 923 - 373}{47032} \times (1 - 0.01) \times 40^{0.82} = 13533 \quad W$$

$$q_d = 70961 \times 1 \times 0.01 \times 40^{0.82} = 14611 \quad W$$

$$dT/dt = \frac{13533 + 14611}{16268 \times 2000} \times 60 = 0.052 \quad K/\text{min}$$